

AN

ANALYSIS OF 230 CASES

OF

LITHOTOMY.

BY

THOMAS BRYANT, F.R.C.S.,

ASSISTANT-SURGEON TO GUY'S HOSPITAL.

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I PROPOSE on the present occasion to bring before the notice of the Society an analysis of all the cases of lithotomy which can be collected from the records of Guy's Hospital of the last twenty-five years, my own notes supplying me with the information for the last eight.

I have been enabled to tabulate 230 cases, and will at once proceed to note such points as their analysis may yield.

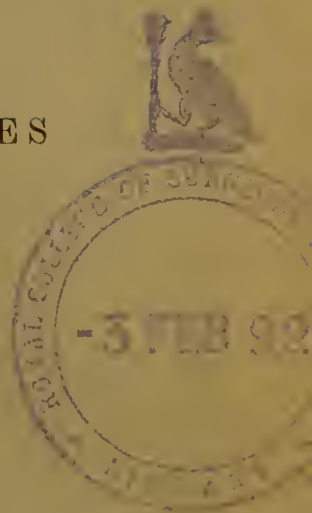


TABLE I.—Containing an analysis of 230 cases of Lithotomy, showing the frequency of its occurrence and mortality at different ages.

Age of patients operated upon.	Number of cases.	Frequency of occurrence, in per-centages.		Recoveries.	Deaths.	Per-centage fatal.	Proportion fatal.		Number of cases.	Fatal.	Proportion.
2 years	6	2·60		5	1	16·66	1 in 6	Under 10 years of age	129	6	1 in 21½
3 "	21	9·13	73 cases, or 31·7 per cent.	21	—	—	—	Med. T. & G.	109	8	1 in 13½
4 "	23	10·00		23	—	—	—	Under 15 years of age	160	8	1 in 20
5 "	23	10·00	{ Under 10 years of age, 129 cases, or 56 per cent.	21	2	4·34	1 in 11½	Med. T. & G.	130	14	1 in 9½
Between 5 and 10 years	56	24·34		53	3	5·34	1 in 18½				
" 10	31	13·47	38 cases, or 16·5 per cent.	29	2	6·45	1 in 15½	{ Between 15 & 40 years of age. Med. T. & G.	—	—	—
" 15	18	7·82		15	3	16·66	1 in 6				
" 20	13	5·65	32 cases, or 13·9 per cent.	11	2	15·38	1 in 6½	{ Above 40 years of age Med. T. & G.	38	6	1 in 6½
" 30	7	3·04		6	1	14·28	1 in 7				
" 40	7	3·04		3	4	57·14	1 in 1¾		23	5	1 in 4½
" 50	19	8·26		8	11	57·89	1 in 1⅞		—	—	—
" 60	5	2·17		2	3	60·00	1 in 1⅓		32	19	1 in 1¾
" 70	1	·43		—	1	100·00	1 in 1		33	21	1 in 1½
	230	99·95		197	33	14·34	1 in 7				

ANALYSIS OF TABLE I.

Frequency of the operation of Lithotomy at the different periods of life.

The first point which attracts our attention in the table before us is the well-recognised fact of the greater frequency of calculous disease in early life; nearly one third of the whole number of cases occurred in children under five years of age, and about one fourth between five and ten years of age; more than half, or 56 per cent. of all the cases, having taken place in children during the first ten years of life.

This truth is one which has never yet received a fair explanation. That the existence of a calculus depends upon a low condition of the child's health hardly bears proof, for it is unquestionably true that the healthiest-looking and apparently best-nourished children admitted into a London hospital are those suffering with stone. Some few of the cases may owe their healthy aspect to the fact that they have been living in the country, and thus, to a London eye, may appear, by comparison, more fat and ruddy than their London fellow-sufferers; but it must be added that by far the majority of the cases occurred in London children, and thus this explanation will not suffice.

It is not, therefore, an unfair assertion to make, that in young life stone in the bladder does not appear to be a disease of debility, but, on the contrary, to belong to a condition of body which is not far from sound health.

The next point indicated by the table appears to be, that *in every succeeding period of five or ten years after ten years of age the presence of a stone becomes more rare.*

Between the ages of ten and fifteen it is about half as frequent as in the preceding quinquennial period, and this number may be again halved when the frequency of its occurrence is observed between the ages of fifteen and twenty. In middle adult life lithotomy is not an operation of frequent occurrence, but in old age it would

appear to be called for rather more frequently. The causes of this difference in adult life it is not difficult to understand, the greater frequency of lithotrity in middle age being the chief.

The mortality after the operation.

The next point in the analysis is the mortality of the operation, and on this subject considerable variation is found at different ages. In analysing my own table I propose to compare it with a second, which is not only the most recent, but which is stated to include the general experience of the London hospitals for three and a half years. I allude to that published in the 'Medical Times and Gazette,' on January 8th, 1859.

With five exceptions, the whole of these cases have been operated upon by the lateral method. In four of the five the median operation was performed, one of which died. In one the stone was extracted through the rectum.

Mortality of the operation at different periods of life.

It will be observed that the operation is most successful during the first ten years of life; indeed, it would be difficult to point to any other capital operation in which like success can be recorded. My own table gives but 4·6 per cent. of fatal cases, or 1 in every $21\frac{1}{2}$. In the table from the 'Medical Times and Gazette' the mortality during these ten years is nearly twice as great, 1 in 13·6 having died. The difference between these two tables in this respect is very great, and is unaccountable.

Upon analysing the cases under ten years of age a little further, it will be seen that at the age of two years 6 cases are recorded, one of which died, but the cause of death was subsequently clearly shown by post-mortem examination to have been acute bronchitis, and was therefore unconnected with the operation.

At the ages of three and four, 44 cases are recorded, but amongst them there is not one fatal instance; those ages must, therefore, be regarded as the most favorable for operation. Between the ages of five and ten, 79 cases are tabulated, 5 of which proved fatal, or about 1 in every 16 operated upon. But if the causes of death are carefully looked for in those 5 cases, the apparent dangers of the operation are much diminished. In 2 cases, aged respectively four and a half and five years, hæmorrhage was the assigned cause of death: in both, however, there had been distinct evidence of the presence of a calculus for at least two years, or nearly half the children's lives, and no post-mortem examination was obtained to reveal the condition of the viscera, and therefore the true causes of death. In 2 cases, aged nine and ten years, in both of which the symptoms of stone had existed from birth, a necropsy revealed extensive and old renal disease. In the last case pelvic cellulitis was proved to have been the cause of death, occasioned by some accident in the operation.

It would thus appear that in children under ten years of age the dangers of the operation are very slight, particularly if the symptoms of stone have not been of long standing; for if the symptoms have not existed for a lengthened period, there is good reason to believe that the kidneys are sound, and if so, the risks of the operation are very slight. If, on the other hand, there has been evidence of the presence of a calculus for some years, or for a large portion of the child's life, renal disease may be suspected, and the danger to life by an operation will consequently be much magnified.

Passing on to the next decennial period, including those operated upon between the ages of ten and twenty, I find 49 cases tabulated, and 5 of these proved fatal, or 10 per cent. On referring to the table in the 'Medical Times and Gazette,' the mortality at these ages is stated to be 21 per cent., being more than twice as great. When we divide these cases again, it will be observed that between the ages of ten and fifteen, that is, *before the period at which*

the genital organs are fairly developed, the mortality is considerably less: 31 cases are recorded, but 2 only died, being 6.4 per cent., or 1 in every $15\frac{1}{2}$ cases; whereas between the ages of fifteen and twenty, that is, *at the period in which those parts have arrived at maturity*, the mortality is more than twice as great; for out of 18 cases 3 died, or 16.6 per cent., or 1 in every 6. This fact is very apparent and important, the risk of the operation being three times as great at this period of life as during the former quinquennial period. But if the causes of death are referred to, the special dangers of the operation are again found to diminish. For it will be seen that in the two cases tabulated as fatal between the ages of ten and fifteen, aged respectively fourteen and fifteen, the symptoms of stone had existed in the former ten years, and in the latter from birth, or as long as could be remembered. In the first case, peritonitis was the assigned cause of death, but no post-mortem examination revealed the fact; in the second, peritonitis was subsequently detected, associated with extensive renal disorganization. In both cases, therefore, it does not appear to be unfair to believe that diseased viscera existed, and that death was due to such complications, and not to any special dangers of the operation.

As to the causes of death of the three fatal cases, out of the eighteen in which lithotomy was performed between the ages of fifteen and twenty, inquiry shows that, in the first, aged eighteen, marked symptoms of stone had been present for three years, and extensive disease of the kidney was subsequently found; in the second, aged nineteen, the symptoms had existed from birth, and the same complication was revealed after death; and in the third, aged twenty, the calculus had given rise to symptoms for eleven years, and hæmorrhage was the assigned cause of death, but no post-mortem examination was subsequently made. In two of these three examples it is positively proved that diseased kidneys were the real cause of death: in the third case, therefore, it is not an unfair supposition to presume that a similar cause existed, this renal disease being tolerably

clearly indicated by the fact that symptoms of stone had been manifested for a long period in each instance.

On continuing the analysis and noting the results of the operation in patients of mature age, it will be seen that the mortality during young adult life and middle age, that is, up to the age of forty, is fixed at about 15 per cent., one patient in every six and a half dying after the operation. It is true that this mortality is three times as great as it is in early life, but still it is not so high as in other severe operations, such as amputation, taking the cases as a whole.

On comparing my own table with that of the 'Medical Times and Gazette,' the comparison is still in my favour; the former yielding a mortality of 15 per cent., the latter of 21 per cent., or one third more.

If we pass on to note the mortality of the operation in patients beyond forty years of age, a very marked difference must be again recorded.

In the earlier periods of life it has been already shown that lithotomy proved fatal in only 5 per cent., or one case in twenty. In young adult life, starting from that period at which the genital organs had become parts of importance, the mortality suddenly became three times as great, or 15 per cent. In the next epoch, or in that after forty years of age, this sudden increase becomes still more apparent, the mortality of the operation rising from 15, to 57 or 58 per cent., nearly four times as great.

The average of the 'Medical Times and Gazette' is about 63 per cent. Looking for the causes of death in the nineteen cases which proved fatal in patients above forty years of age, a striking fact again comes before us; in ten of them a post-mortem examination was subsequently made, and *in all* extensive renal disease was readily detected.

Five of the remaining cases sank after the operation; three died with symptoms of peritonitis and pelvic cellulitis; one had acute cystitis. In all of these cases there had been evidence of calculous disease of some years' duration.

Review of the cases as a whole.

The most prominent point which attracts attention is the great difference in the mortality of the operation of lithotomy at the different periods of life.

In early life it is unquestionably a very satisfactory operation, if not the most successful which can be performed. In young adult life, up to forty years of age, the facts, as already stated, are by no means bad. It is true that about one case in every six and a half dies; but when it is remembered that it is at such a period of life that lithotritry is generally practised, and that, therefore, the worst cases only are lithotomized, the result cannot be regarded as indifferent.

In old age, or after fifty years of life, the operation cannot be looked upon with satisfaction, more than half, or 60 per cent., dying. The cause of death in the majority of these cases has been clearly shown to have been renal disease; and if this complication is a fatal one after most operations, it is palpably of greater importance in that which we are now considering.

In the previous pages it has been pointed out how fatal such disease has been found, and it may be safely asserted that from the earliest to the latest periods of life the risks of lithotomy are exactly commensurate with the extent of disease in the renal organs. Thus, in young life, when it is by no means of common occurrence, a good result, as a rule, takes place; but at a later period, when its presence is more frequent, a bad result has too commonly to be recorded.

The gauge of the extent of the renal disease has also been tolerably clearly indicated, the duration of the symptoms appearing to be a correct guide to aid us in arriving at the result. The analysis has shown that in early life, when death followed the operation, renal disease was observed in every case in which a post-mortem examination was subsequently made, and from similarity of symptoms it does not appear to be improbable that like complications existed

in the remainder. For it is certainly a striking fact that in seventeen out of the nineteen necropsies extensive renal disease was observed, and in the remaining two acute bronchitis and an accidental complication were the cause of death; and if the condition of the "unseen" can be diagnosed by the "seen," the presumption that renal disease was the cause of death in the majority of fatal instances does not appear to be unfair.

But to make this point more clear the two following tables may prove of value, the first containing an analysis of the cases examined after death, the second containing those in which no post-mortem examination could be obtained, with their assigned causes of death.

TABLE II.—*Showing the causes of death, as proved by post-mortem examination; the ages of the patients being also given, with the duration of the symptoms.*

Case.	Age.	Cause of death.			Duration of symptoms.
1	2	Acute bronchitis			From birth.
2	6	Pelvic cellulitis, the result of an accident			
3	9	Peritonitis and pelvic cellulitis.	Diseased kidneys		
4	10	Ditto	ditto	Ditto	
5	15	Ditto	ditto	Ditto	
6	18	Ditto	ditto	Ditto	
7	19	Ditto	ditto	Ditto	
8	24	Diseased kidneys			Many years.
9	29	Ditto			Ditto.
10	38	Ditto			Ditto.
11	43	Diarrhœa.	Diseased kidneys		10 years.
12	54	Pyæmia.	Diseased kidneys		3 years.
13	56	Diseased kidneys			3 years.
14	58	Peritonitis and pelvic cellulitis.	Diseased kidneys		8 years.
15	59	Inflammation of whole urinary passage.		Diseased kidneys }	6 years.
16	59	Peritonitis and pelvic cellulitis.			
17	65	Ditto	ditto	Ditto	6 years.
18	68	Ditto	ditto	Ditto	2 years.
19	70	Ditto	ditto	Ditto	3 years.

ANALYSIS OF TABLE II.

In seventeen of the nineteen cases it must be observed that disease of the kidney, in different degrees of severity, existed, and that this disease was of no doubtful nature, suppuration and degeneration being present in nearly all.

In nine of these cases peritonitis and pelvic cellulitis were also present.

In two, pyæmia was an associated cause.

In one, extreme inflammation of the urinary passages.

And in five instances renal disease was sufficient to destroy.

TABLE III.—*Showing the assigned causes of death, not proved by post-mortem examination.*

Case.	Age.	Assigned cause of death.	Duration of Symptoms.
1	4½	Died from hæmorrhage	3 years.
2	5	Ditto	8 years.
3	20	Ditto	12 years.
4	14	Died from peritonitis and pelvic cellulitis	10 years.
5	51	Ditto	6 years.
6	32	Ditto	18 years.
7	54	Ditto	3 years.
8	41	Sunk after the operation	Many years.
9	42	Ditto	Ditto.
10	49	Ditto	5 years.
11	54	Ditto	2 years.
12	72	Ditto	5 years.
13	57	Acute cystitis	12 years.
14	57	Pyæmia after wound had healed	4 years.

From Table II it appears to be clearly shown that, in seventeen instances out of the nineteen in which any definite information was obtained concerning the causes of death, the fatal result might, in all fairness, be ascribed to diseased kidneys, with or without any other complications. This visceral disease has been shown to have existed in the young and in the old, and, eliminating accidents, it appears to be the chief cause of death.

The fact that peritonitis and pelvic cellulitis were present in a large proportion of the cases examined need be no argument against this view, for physicians and surgeons are all well aware of the intimate connection which exists between renal disease and inflammation of the serous membranes. In medical practice this form of inflammation is, as a rule, the immediate cause of death in most examples of Bright's disease; it does not, therefore, appear irrational to doubt whether so many patients, either young or old, would sink with peritonitis and pelvic cellulitis after the operation of lithotomy, if they had not been rendered prone to such inflammation by the presence of a renal affection.

This doubt is much strengthened by the facts, that in children the operation of lithotomy is undeniably successful, and that in early life renal disease is not common. At the same time it has been shown that when death takes place, even in children, renal disease is a frequent cause of it.

From the second table somewhat similar conclusions may not unfairly be deduced: in each of the fatal cases tabulated under puberty symptoms had existed for nearly two thirds of life, and, as a consequence, diseased kidneys in all probability were present, and were the cause of death.

In the older subjects, also, like explanations of the mortality appear to be supported.

As a practical conclusion, the preceding analysis leads us with some confidence to assert—

That the dangers of lithotomy, as an operation, independently of accidents, are not great, and that a fatal result from them alone rarely takes place.

That, when death follows the operation, renal disease is the cause in almost all cases, and that this renal affection appears to follow necessarily upon the long existence of the calculus.

That the duration of the symptoms is the best and surest guide to the diagnosis of this complication, and that in pro-

portion to the period of their existence is a renal affection, as well as its extent, to be suspected, and, as a result, is the danger of the operation to be dreaded.

The early detection of a calculus becomes, therefore, an important point, and its early removal a necessity.

The prognosis after the operation rests also upon the same grounds. The shorter the duration of the symptoms the more favorable may it be; and, on the contrary, the longer they have existed it must be the more cautious.

The operation may be justifiable in all instances, but it must be undertaken with two distinct objects. In one case it would be performed with the idea and fair certainty of a cure; in the other it would be done solely with the laudable intention of giving relief, and thus of rendering the patient's last days more comfortable.

In conclusion, I may refer to the smaller mortality recorded in my table than that of the 'Medical Times and Gazette.' It is impossible to assign any definite cause for this, but, amongst others, perhaps the advocates of the use of the *straight staff* might not unfairly consider the fact a strong argument in their favour.

There is one other point also which the analysis of the cases in the 'Medical Times and Gazette' makes of interest. The editor shows that there are about forty cases of lithotomy a year in the London hospitals. At Guy's my own notes prove that the average for the last eight years has been fifteen, this figure representing more than one third of the whole number of cases operated upon in London each year, or 37·5 per cent. In St. Bartholomew's Hospital the number of cases operated upon in 1860 was ten. In St. Thomas's the average is given to us as eight.

Dr. Marcet, in his work 'On Calculous Disorders,' published forty years ago, shows that in St. Bartholomew's Hospital, at that period, the average number of cases for five years was eleven a year. In St. Thomas's it was five and a half, and Mr. South's more recent statistics confirm

the fact. In Guy's, when a little more than half its present size, the average was then given as nine or ten.

These facts tend to show that stone cases are not rarer in London hospitals than they were, and to dispel the idea that, from the freedom with which they are treated in the provinces, the metropolitan institutions will be deprived of their lithotomy practice. It may be that calculous disorders are increasing, but it is more probable that a larger number of such cases are detected, and consequently treated.

POSTSCRIPT.

July 19th, 1862.

TABLE IV.—*Showing the apparent influence of chloroform upon the mortality of Lithotomy.*

Cases in which chloroform <i>was</i> given.					Cases in which it <i>was not</i> .				
Ages.	Number.	Cured.	Died.	Per-centage.	Number.	Cured.	Died.	Per-centage.	
5 years of age and under	40	38	2	5·	31	30	1	3·33	} 3·1
6 years and 10 inclusive	38	35	3	7·8	21	21	—	—	
11 " 15 "	19	18	1	5·2	11	10	1	9·09	
16 " 20 "	10	7	3	30·	8	8	—	—	} 35·2
21 " 30 "	5	3	2	40·	8	8	—	—	
31 " 40 "	2	1	1	50·	5	5	—	—	
41 " 50 "	4	2	2	50·	3	1	2	66·66	} 56·2
51 " 60 "	9	3	6	66·	10	5	5	50·	
61 " 70 "	3	1	2	66·	2	1	1	50·	
71 " 80 "	—	—	—	—	1	—	1	100·	
	130	108	22	16·9	100	89	11	11·	

The weight of evidence afforded by this table, taking the numbers as a whole, apparently tends against the administration of chloroform. The mortality of the operation of lithotomy without the use of the anæsthetic was 11 per cent., and with it 16·9 per cent.; the difference between the two classes of cases was, therefore, 3·9 per cent., the use of chloroform raising the mortality 50 per cent.

The conclusion to be deduced from these figures is somewhat startling, and it is difficult to believe that it can be correct. An inquiry into the causes of death of the two classes has failed to give any satisfactory solution of the difficulty, and as facts are wanting, theory may be justifiable.

A partial explanation of this apparent difference is, I believe, to be found in the fact that, since the introduction of chloroform, surgeons have been induced to submit patients to the operation of lithotomy, for the purpose of removing a source of irritation and of relieving pain, more frequently than they were in the habit of doing before the use of the anæsthetic had become known; and that by this practice a bad and necessarily fatal class of cases has been admitted into one part of the table which is excluded from the other.

This change of practice I take to be nearly sufficient of itself to account for the difference; but as an additional explanation of the discrepancy, the following does not appear to be unfair.

In the body of my paper I have shown how fatal renal disease has always been as a complication of lithotomy, and it can hardly be denied that chloroform, in common with all stimulants, has a powerful effect upon the kidneys. If these organs are sound, no evil will be experienced from its use; but if inflamed or diseased, a bad effect must be produced. It does not appear, therefore, to be improbable that it is by this stimulating effect upon a diseased organ that the increased mortality of the operation of lithotomy under the influence of chloroform may be partially explained.

A patient with extensive renal disease, subjected to lithotomy, will certainly sink, whether chloroform be employed

or not ; but there is probably a degree of renal disease which, though not of itself sufficient to destroy, may yet, under the evil influence of a powerful stimulant such as chloroform, be aggravated into importance, and prove dangerous to life. The use of the anæsthetic in these doubtful cases may weigh down the finely suspended balance of life and death, and by stimulating inflamed and diseased kidneys, expedite a fatal result.

